REMARKS

Claims 1-61 are presently pending in the above-identified patent application. Claims 47-61 have been rejected, and the drawings and the specification have been objected to. Claims 1-46 have been withdrawn from consideration. Claims 49 and 56 have been amended. Reconsideration and allowance of all pending claims is requested.

The drawings stand objected to because "Figure 3 is blank/contains no illustration". Concurrent with this response, the applicant has included a higher-quality printout of the photomicrograph of Figure 3 than that was originally filed.

The specification stands objected to as including several informalities. Applicant has amended the abstract, at paragraph [0045] on page 22 to reflect the subject matter as originally recited in the elected claims. Paragraph [0006] on page 2 has been amended to include an erroneously omitted word. "Crystoballite" is correctly spelled, and hence the applicant had not made any correction in paragraphs [0041] and [0042].

Claims 49 and 56 stand rejected under 35 U.S.C. § 112 as allegedly being vague and indefinite because the meaning of "predetermined concentration" is unclear. Applicant has amended claims 49 and 56 to remove the term "predetermined".

Claims 47, 49, 50, 52-54, 56, 57, and 59-61 stand rejected under 35 U.S.C. § 102 as being anticipated by Pham et al., U.S. Patent No. 6,548,440 (hereafter "Pham"). Claim 47, from which depend claims 49, 50, 52 and 53, recites a method of making a ceramic composite comprising a mesoporous matrix. The recited mesoporous matrix comprises a ceramic matrix and has a plurality of pores dispersed therethrough. The plurality of pores form a mesoporous network, and an array of ceramic nanoparticles templated within the mesoporous network, and each of the plurality of ceramic

nanoparticles has at least one dimension of less than about 100 nm. The array forms an ordered structure within the mesoporous network. The method comprises, among several steps, forming a templated mesoporous network within the matrix material and infiltrating the templated mesoporous network with an oxide precursor. Claim 54, from which depend claims 56, 57 and 59-61, recites a method of making a ceramic composite article, the ceramic composite article comprising a mesoporous matrix, the mesoporous matrix comprising a ceramic matrix and having a plurality of pores dispersed therethrough. The method as recited in claim 54 comprises, among several steps, forming a templated mesoporous network within the matrix material, wherein the mesoporous network has a controlled pore size, and infiltrating the templated mesoporous network with an oxide precursor.

Pham relates to a method of encapsulating a dispersed insoluble compound in a mesoporous structure by combining a soluble oxide precursor (such as, for example, a silicon alkoxide to form a mesoporous silica structure) along with a solvent, and a surfactant to form a mixture; dispersing the insoluble compound in the mixture; spray-drying the mixture to produce a dry powder; and calcining the dry powder to yield a porous structure comprising dispersed insoluble compound. Pham discusses that it is the preformed nanoparticles of the catalyst that are added to the mixture (column 10, lines 38-67 and column 12, lines 25-36). This is in distinction to "infiltrating the templated mesoporous network with an oxide precursor" as recited in claims 47 and 54. In fact, Pham teaches away from using soluble metal compounds to be used in the mixture, and recommends insoluble metal compounds taken in the form of colloids (column 9, lines 19-23).

In the methods recited in claims 47 and 54, a preformed mesoporous structure is provided, which is infiltrated with an oxide precursor. The oxide precursor forms the desired inorganic nanoparticles on calcination. Further, the oxide precursor is converted into inorganic nanoparticles within the templated mesoporous network to form the

ceramic composite. In contrast, in the process disclosed in Pham, a soluble oxide precursor (such as, for example, a silicon alkoxide to form a mesoporous silica structure) along with a solvent, and a surfactant and is mixed to form a mixture. The insoluble compound is dispersed in the mixture and is not infiltrated into a mesoporous network as recited in claims 47 and 54. It is during the spray drying of the mixture including the soluble precursor of the mesoporous material and the insoluble compound (preformed nanomaterial) that the solvent evaporation and polymerization processes happen to form catalyst/support porous particles, which on calcination yields porous structures comprising dispersed catalysts (column 11, lines 64-67 and column 12, lines 1-8). In fact, Pham teaches away from infiltrating preformed mesoporous supports with catalysts, for example, in column 9, lines 57-67, "In many applications where high loading of the dispersed phase is required, impregnating a mesoporous support with a catalytically active metal results in non-spherical particles.....the method of the present invention produces spherically shaped particles with high loading of the dispersed phase." Pham fails to teach or suggest "infiltrating the templated mesoporous network with an oxide precursor; and converting the oxide precursor into inorganic nanoparticles within the templated mesoporous network to form the ceramic composite" as recited in claims 47 and 54.

Applicants thus respectfully submit that claim 47, and its dependent claims 49, 50, 52 and 53, as well as claim 54 and its dependent claims 56, 57 and 59-61, are patentable over Pham.

Claims 51, 58 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Pham. Claims 48 and 55 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Pham in view of Tanev. Claims 48 and 51 depend from independent claim 47, while claims 55 and 58 depend from independent claim 54.

As discussed above, Pham does not teach or suggest each and every element of the method recited in independent claims 47 and 54. In particular, Pham fails to teach or suggest "infiltrating the templated mesoporous network with an oxide precursor; and converting the oxide precursor into inorganic nanoparticles within the templated mesoporous network to form the ceramic composite." Tanev is relied upon in the Office action as teaching forming templated mesoporous silica materials. Tanev is completely unavailing as a reference that teaches or suggests "infiltrating the templated mesoporous network with an oxide precursor; and converting the oxide precursor into inorganic nanoparticles within the templated mesoporous network to form the ceramic composite" as recited in claims 47 and 54. Thus, claims 48, 51, 55 and 58 are patentably distinct from the cited references.

In view of the remarks and amendments set forth above, applicant respectfully requests allowance of the pending claims. If the Examiner believes that a telephonic interview will help speed this application toward issuance, the Examiner is invited to contact Paul DiConza at (518) 387-6131.

Respectfully submitted,

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